

Translation

PATENT COOPERATION TREATY

PCT/EP2003/013353



PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 02SGL0112WOP	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/EP2003/013353	International filing date (<i>day/month/year</i>) 27 November 2003 (27.11.2003)	Priority date (<i>day/month/year</i>) 03 December 2002 (03.12.2002)
International Patent Classification (IPC) or national classification and IPC H05B 3/03		
Applicant SCHOTT AG		

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 6 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
 - ☒ (*sent to the applicant and to the International Bureau*) a total of 13 sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - ☐ (*sent to the International Bureau only*) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
- This report contains indications relating to the following items:
 - ☒ Box No. I Basis of the report
 - ☐ Box No. II Priority
 - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - ☐ Box No. IV Lack of unity of invention
 - ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - ☐ Box No. VI Certain documents cited
 - ☐ Box No. VII Certain defects in the international application
 - ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 08 May 2004 (08.05.2004)	Date of completion of this report 17 March 2005 (17.03.2005)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2003/013353

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on translations from the original language into the following language _____, which is language of a translation furnished for the purpose of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☐ The international application as originally filed/furnished

- ☒ the description:

pages _____ 1, 3-54 _____, as originally filed/furnished

pages* _____ 2 _____ received by this Authority on 10 December 2004 (10.12.2004)

pages* _____ received by this Authority on _____

- ☒ the claims:

pages _____, as originally filed/furnished

pages* _____, as amended (together with any statement) under Article 19

pages* _____ 1-71 _____ received by this Authority on 10 December 2004 (10.12.2004)

pages* _____ received by this Authority on _____

- ☒ the drawings:

pages _____ 1/7-7/7 _____, as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP 03/13353

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-71	YES
	Claims		NO
Inventive step (IS)	Claims	1-71	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-71	YES
	Claims		NO

2. Citations and explanations

1. This report makes reference to the following document:

D1: US-A-4 246 433 (SEIFRIED GEORGE B ET AL)
20 January 1981 (1981-01-20).

2. The present application complies with the requirements of PCT Article 33(2), because the subject matter of claims 1-71 is novel.

3. The present application complies with the requirements of PCT Article 33(3), because the subject matter of claims 1-71 involves an inventive step.

4.1 The invention relates to a method and a device for heating melts, more particularly a method for the conductive heating of melts with cooled walls, in which the melt is conductively heated and the current flows between at least two cooled electrodes, such as is known from document D1.

The closest prior art is document D1, from which the claimed invention differs by the characterizing portion of claim 1: in that each electrode replaces a particular component of the wall of the melt vessel and the melt contact surface forms a wall area of the melt vessel.

4.2 Claim 1 is therefore considered to be novel.

It should be noted that, in the electrically heated trough described in D1, the electrodes are introduced into the glass melt through the side walls of the trough and are surrounded on all sides by the glass melt.

4.3 Inventive step

The effect of the above-mentioned characterizing portion of claim 1 is that chemical attack of the melt on the walls is prevented and **more energy is supplied** to the melt.

The technical problem can be considered that of providing a method with which the walls of the melt aggregate can be cooled sufficiently to prevent chemical attack of the melt on the walls and with which **more energy can be supplied** to the melt than is withdrawn from it through the cooled walls.

This problem is solved according to the invention with a method for heating melts, more particularly a method for conductively heating melts with cooled walls, in which the melt is conductively heated and the current flows between at least two cooled electrodes, each electrode replacing a particular component of the wall of the melt vessel.

The invention can also be interpreted to mean that, when electrodes are introduced or inserted into a melt vessel of predefined geometry, the sum of the surfaces of the melt vessel and electrodes in the region of the melt remains **constant**. If, for example, a particular geometry of the melt vessel is chosen, the electrodes include part of the walls of the melt vessel, the chosen geometry being **retained**.

The electrodes are integrated in a melt or refining aggregate in such a way that **the melt contact surface forms a wall area of the melt vessel**. To this end, the electrodes can advantageously be introduced into recesses

in the cooled walls of the melt vessel. With the claimed arrangement, **a favourable ratio** of the surface portion of the melt vessel through which energy is introduced into the melt to the surface portion of cooled walls is achieved.

By contrast, **the wall area** has, until now, been **enlarged**, for example by additionally introducing finger electrodes (as, for example, in the cited D1), and the cooling power also **increased** accordingly.

Consequently, claim 1 involves an inventive step.

5. Similar reasoning can be applied to device claim 30.

Consequently, claim 30 is novel and involves an inventive step.

6. Claims 2-29 and 31-71 are dependent claims which, in conjunction with claims 1 and 30, comply with the requirements of PCT Article 33(2) and (3).

7. The industrial applicability of the subject matter of claims 1-71 is beyond doubt. Consequently, claims 1-71 comply with the requirements of PCT Article 33(4).